

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

All claims currently being amended are shown with deleted text struckthrough or double bracketed and new text underlined. Additionally, the status of each claim is indicated in parenthetical expression following the claim number.

Claims 1-9 and 22-25 were previously cancelled.

Claims 10-21 and 26-34 remain in this application.

Claims 10, 14, 16, 31 are being amended.

Claims 11, 12 and 18 are being cancelled.

WHAT IS CLAIMED IS:

1-9. (Cancelled).

10. (Currently amended) A process for forming a three-layered thin film composite solid ~~suitable for use as an~~ electrolyte comprising the steps of:

(a) tape casting a series of sheets or films, each said sheet formed from one of at least two slip composites, each said slip composite containing an electrolyte where the electrolyte of each said slip composite has a coefficient of thermal expansion, [{"CTE") and}] said [CTE of] coefficient for each said electrolyte in each said slip composite is identical within +/- 5%, wherein one of the said slip composites is formed with an added combustible pore former (a "Porous Material")[,] and another of said slip composites is formed without said pore former material (a "Non Porous Material");

(b) laminating said series of sheets to create a layered structure having at least three layers, where said series of layers alternate between layers formed from said Non-Porous Materials and layers formed from said Porous Materials; and

(c) sintering said layered structure [[to a suitable]] at a final sintering temperature to densify said layer formed from said Non Porous Materials to create an ionically conductive layer, whereas said final sintering temperature is about 1500-1600°C.

11. (Cancelled)

12. (Cancelled)

13. (Previously presented) The process of claim 10 wherein said sintering step is performed without encapsulation of said layered structure.

14. (Currently amended) The process of claim 10 wherein said sintering step includes the substep of raising the temperature to a first temperature, wherein said first temperature is sufficient to combust said pore former material, and then raising said temperature to [[a]] the final sintering temperature, ~~wherein said final temperature is sufficient to densify said layer formed from said Non-Porous Materials.~~

15. (Previously presented) The process of claim 14 wherein said substep of raising the temperature to a first temperature is undertaken at a rate to allow gases generated from combustion of said pore former to escape said layered structure without delaminating said layered structure in whole or in part.

16. (Currently amended) The process of claim [[12]] 10 wherein said step of sintering includes the step of raising the temperature to a first temperature suitable to allow combustion of said pore former; then raising said temperature to a second intermediate temperature, then raising the temperature to [[a]] the final sintering temperature, wherein the rate of temperature rise from said second intermediate temperature to said final sintering temperature is at least about 10°C/minute.

17. (Previously presented) The process of claim 10 wherein said electrolyte is further comprised of β'' -Al₂O₃ or β -Al₂O₃ or mixtures thereof.

18. (Cancelled)

19. (Previously presented) The process of claim 10 wherein the thickness of said layers formed from Non-Porous Materials, after sintering, are less than 100 microns.

20. (Previously presented) The process of claim 10 wherein the thickness of said layers formed from Porous Materials is greater than about 100 microns.

21. (Previously presented) The process of claim 20 wherein said thickness of said layers formed from Porous Materials is sufficient to provide structural support to said thin film composite solid.

22-25. (Cancelled)

26. (Previously presented) The process of claim 10 wherein each of said slip composites contains a binder.

27. (Previously presented) The process of claim 10 wherein each of said slip composites contains a plastizer.

28. (Previously presented) The process of claim 10 wherein at least one of said layers formed of said Porous Material are laminated from a plurality of said sheets formed from said Porous Material.

29. (Previously presented) The process of claim 10 wherein at least one of said layers formed from said Non Porous Material are laminated from a plurality of said sheets formed from said Non Porous Material.

30. (Previously presented) The process of claim 19 wherein the thickness of said layers formed from said Non Porous Material, after sintering, is less than 50 microns.

31. (Currently amended) The process of claim 16, wherein said second intermediate temperature is in the range of about 1200-1275°C, ~~and said final temperature is in the range of about 1,500—1,600°C.~~

32. (Previously presented) The process of claim 16 wherein the rate of temperature rise from said second intermediate temperature to said final sintering temperature is at least about $+25^{\circ}\text{C}/\text{minute}$ once said temperature is about 1275°C .

33. (Previously presented) The process of claim 32 further including the step of lowering said temperature from said final sintering temperature to about said second intermediate temperature wherein the rate of temperature drop from said final sintering temperature to said second intermediate temperature is at least about $25^{\circ}\text{C}/\text{minute}$ until said temperature is about 1275°C .

34. (Previously presented) The process of claim 33 wherein said step of lowering said temperature from said final sintering temperature to about said second intermediate temperature takes place at a rate of temperature drop in a range of least about $10\text{-}30^{\circ}\text{C}/\text{minute}$ until said temperature is about 1275°C .